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Canadian Industry's Expenditures to Reduce Greenhouse Gas Emissions

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Canadian Industry's Expenditures to Reduce Greenhouse Gas Emissions

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.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0s	value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
p	preliminary
r	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
E	use with caution
F	too unreliable to be published

Table of contents

Canadian Industry's Expenditures to Reduce Greenhouse Gas Emissions

1	Introduction	4
2	Overview	4
3	Impact of revision on the 2002 expenditure estimates made to reduce greenhouse gas emissions emissions	4
4	Conclusion	5

Canadian Industry's Expenditures to Reduce Greenhouse Gas Emissions

by Jeff Fritzsche

1 Introduction

In 2002, the Survey of Environmental Protection Expenditures introduced new material for the purpose of collecting data on industry's initiatives with respect to greenhouse gas emission reductions. This was made possible through five years of funding provided by the Statistical Monitoring of Climate Change Technologies project under the federal government's Action Plan 2000 on Climate Change. The material was developed as part of a multi-departmental Working Group on Climate Change Technologies co-chaired by Industry Canada and Statistics Canada.

2 Overview

Statistics contained in this report are derived from the 2002 and 2004 editions of the Survey of Environmental Protection Expenditures. The tables contain information specifically related to expenditures made by Canadian businesses in 16 industry groups to reduce greenhouse gas emissions. Additional tables include statistics on the technologies used by industry as well as the obstacles and drivers encountered by industry to reduce greenhouse gas emissions.

The 2002 expenditure estimates in this report are revised figures and replace the estimates published in the 2002 survey report "Environmental Protection Expenditures in the Business Sector", catalogue nº 16F0006. Improvements made to the methodology used to produce the 2004 estimates were applied to the 2002 estimates to maintain comparability between survey years.

3 Impact of revision on the 2002 expenditure estimates made to reduce greenhouse gas emissions emissions

The impact of the revision of the 2002 estimates resulted in an increase in the estimated overall expenditures made to reduce greenhouse gas emissions. The revised estimate increased by $170.0 million dollars or 15.8%. The revision had a larger impact on operating expenses than capital expenditure estimates, increasing these 22.6% and 9.8% respectively.

The 2002 estimates for the majority of the 16 industry groups surveyed were revised upwards. The industries with the greatest increase in terms of absolute expenditures included Electric Power Generation, Transmission and Distribution, Wood Products, Chemicals and Fabricated Metal Products industries. The industry with the largest downward revision was Oil and Gas Extraction.

This report includes the 2002 revised expenditure estimates to reduce GHG emissions by industry and by province, as well as the 2004 estimates. Additional tables for reference include both 2002 and 2004 estimates of energy conservation processes and technologies used by industry and the drivers and obstacles faced by industry in the adoption of the energy conservation processes and technologies. Please note that only the tables with expenditure estimates have been revised for 2002.

4 Conclusion

Data collection specifically related to the expenditures to reduce GHG emissions, the impact of those expenditures on emissions and the obstacles and drivers businesses encountered were discontinued after the 2004 reference year due to the sun setting of the Statistical Monitoring of Climate Change Technologies project funding.

Additional analysis of the 2002 and 2004 greenhouse gas-related estimates from the Survey of Environmental Protection Expenditures is available in "Envirostats", catalogue number 16-002-X, Volume 2, No. 2.

Table 1
Proportion of establishments in fossil-fuel related industries that reported greenhouse gas emissions reductions

	2002		2004	
	Reduced fugitive or vented	Reduced other sources	Reduced fugitive or vented	Reduced other sources
	percent [1]			
Oil and gas extraction	90	76	94	75
Natural gas distribution	92	67	92	77
Pipeline transportation	95	67	85	44
Petroleum and coal products	58	89	89	74
Total [2]	**87**	**74**	**90**	**62**

1. Number of establishments that reported the use of systems or equipment to reduce greenhouse gas emissions as a percentage of establishments that reported extracting, refining, transporting, or distributing fossil fuels.
2. Number of establishments that indicated they used at least one energy conservation process or technology as a percentage of the total number of establishments that provided a response.

Note(s): This table includes reported data only.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 2
Adoption and impact of new or significantly improved systems or equipment to reduce greenhouse gas emissions by industry

	2002 [1]					2004 [2]				
	New or improved systems or equipment		Impact on emissions [3]			New or improved systems or equipment		Impact on emissions [3]		
	Yes	No	Low	Moderate	High	Yes	No	Low	Moderate	High
	percent									
Logging	11	89	71	29	0	15	85	64	18	18
Oil and gas extraction	65	35	31	57	12	63	37	39	41	20
Mining	18	82	70	30	0	24	76	69	31	0
Electric power generation, transmission and distribution	29	71	45	23	32	27	73	44	33	22
Natural gas distribution	58	42	0	71	29	53	47	25	50	25
Food	10	90	59	41	0	24	76	53	35	18
Beverage and tobacco products	16	84	60	40	0	33	67	57	29	14
Wood products	14	86	50	36	14	19	81	45	36	18
Pulp, paper and paperboard mills	35	65	40	36	24	38	63	34	49	17
Petroleum and coal products	39	61	62	38	0	43	57	83	17	0
Chemicals	18	82	55	33	13	19	81	52	31	17
Non-metallic mineral products	18	82	46	31	23	18	82	53	40	7
Primary metals	21	79	30	51	19	26	74	41	43	15
Fabricated metal products	18	82	43	50	7	16	84	47	35	18
Transportation equipment	23	77	59	32	9	31	69	68	20	12
Pipeline transportation	71	29	17	80	3	35	65	58	42	0
Total	**24**	**76**	**44**	**44**	**13**	**26**	**74**	**49**	**36**	**14**

1. Adoption of new or significantly improved systems or equipment within a three year period, 2000 to 2002.
2. Adoption of new or significantly improved systems or equipment within a three-year period, 2002 to 2004.
3. Respondents who answered Yes to the adoption of new or significantly improved systems or equipment were asked to rank the impact on greenhouse gas emission reductions as being low, moderate or high.

Note(s): This table includes reported data only. Figures may not add up to totals due to rounding.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 3
Adoption and impact of new or significantly improved systems or equipment to reduce greenhouse gas emissions by province or territory

	2002 [1]					2004 [2]				
	New or improved systems or equipent		Impact on emissions [3]			New or improved systems or equipent		Impact on emissions [3]		
	Yes	No	Low	Moderate	High	Yes	No	Low	Moderate	High
	percent									
Newfoundland and Labrador	14	86	100	0	0	13	88	100	0	0
Prince Edward Island	10	90	100	0	0	8	75	100	0	0
Nova Scotia	27	73	63	25	13	21	79	29	71	0
New Brunswick	21	79	33	50	17	27	73	67	33	0
Quebec	20	80	43	43	14	29	71	52	30	19
Ontario	20	80	52	36	12	20	80	53	37	11
Manitoba	36	64	29	38	33	30	70	47	29	24
Saskatchewan	41	59	40	52	8	41	59	54	42	4
Alberta	34	66	36	54	10	35	65	39	34	27
British Columbia	22	78	37	51	11	28	72	45	49	6
Yukon Territory, Northwest Territories and Nunavut	30	70	33	67	0	44	56	50	50	0
Total	**24**	**76**	**44**	**44**	**13**	**26**	**74**	**49**	**36**	**14**

1. Adoption of new or significantly improved systems or equipment within a three year period, 2000 to 2002.
2. Adoption of new or significantly improved systems or equipment within a three-year period, 2002 to 2004.
3. Respondents who answered Yes to the adoption of new or significantly improved systems or equipment were asked to rank the impact on greenhouse gas emission reductions as being low, moderate or high.

Note(s): This table includes reported data only. Figures may not add up to totals due to rounding.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 4
Total operating and capital expenditures on environmental processes and technologies to reduce greenhouse gas emissions by industry

	2002 [r]			2004		
	Operating expenditures	Capital expenditures	Total	Operating expenditures	Capital expenditures	Total
	millions dollars					
Logging	23.3	7.1	**30.4**	52.0	8.5	**60.5**
Oil and gas extraction	8.4	206.9	**215.3**	23.0	124.8	**147.8**
Mining	19.4	8.5	**27.9**	38.0	10.1	**48.1**
Electric power generation, transmission and distribution	128.2	119.1	**247.2**	75.7	21.2	**96.9**
Natural gas distribution	6.2	2.9	**9.1**	3.5	5.2	**8.7**
Food	21.2	14.9	**36.1**	8.8	23.7	**32.5**
Beverage and tobacco products	1.7	6.5	**8.2**	1.7	3.7	**5.4**
Wood products	114.5	26.2	**140.7**	106.5	45.9	**152.3**
Pulp, paper and paperboard mills	170.6	62.6	**233.3**	129.8	37.2	**167.1**
Petroleum and coal products	3.0	25.3	**28.3**	1.2	37.1	**38.3**
Chemicals	67.3	32.4	**99.6**	57.9	25.7	**83.6**
Non-metallic mineral products	6.0	22.2	**28.2**	11.0	8.1	**19.1**
Primary metals	13.0	46.7	**59.7**	34.9	5.4	**40.3**
Fabricated metal products	15.6	18.3	**33.9**	22.4	8.7	**31.1**
Transportation equipment	33.2	8.7	**41.9**	6.5	10.8	**17.3**
Pipeline transportation	9.4	32.0	**41.4**	3.1	3.1	**6.2**
Total	**641.0**	**640.2**	**1,281.3**	**575.8**	**379.3**	**955.1**

Note(s): Figures may not add up to totals due to rounding.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 5
Total operating and capital expenditures on environmental processes and technologies to reduce greenhouse gas emissions by province or territory

	2002 r			2004		
	Operating expenditures	Capital expenditures	Total	Operating expenditures	Capital expenditures	Total
	million dollars					
Newfoundland and Labrador	7.2	30.0	**37.2**	8.7	5.8	**14.5**
Prince Edward Island	1.1	0.9	**2.0**	1.7	0.6	**2.4**
Nova Scotia	22.9	7.5	**30.4**	23.6	2.9	**26.5**
New Brunswick	21.0	15.6	**36.6**	35.3	11.1	**46.3**
Quebec	108.9	104.5	**213.4**	74.8	71.0	**145.9**
Ontario	167.7	167.1	**334.8**	88.0	54.4	**142.4**
Manitoba	32.5	13.6	**46.1**	23.0	28.9	**51.8**
Saskatchewan	18.3	22.5	**40.8**	13.5	7.6	**21.2**
Alberta	73.9	234.1	**308.0**	62.5	155.1	**217.6**
British Columbia	184.8	42.9	**227.7**	229.5	40.8	**270.3**
Yukon Territory, Northwest Territories and Nunavut	2.5	1.6	**4.2**	15.1	1.1	**16.2**
Total	**641.0**	**640.2**	**1,281.3**	**575.8**	**379.3**	**955.1**

Note(s): Figures may not add up to totals due to rounding. This table excludes the "other manufacturing" industries category.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 6
Obstacles to the adoption of technologies to reduce greenhouse gas emissions by industry, 2002 and 2004

	Type of obstacles							One or more obstacles	
	Lack of information or knowledge	Lack of available technology	Lack of skilled personnel	High cost of equipment	Lack of financing	Regulatory or policy barriers	Other	Share of companies in industry	Industry share [1]
	percent [2]								
2002 [3]									
Logging	43	57	14	71	29	0	14	42	3
Oil and gas extraction	35	35	10	88	52	48	21	77	8
Mining	10	20	5	50	30	20	20	88	6
Electric power generation, transmission and distribution	25	35	5	65	25	50	10	55	9
Natural gas distribution	33	50	0	83	50	67	17	67	4
Food	27	33	7	73	60	7	27	82	9
Beverage and tobacco products	40	10	30	80	30	0	0	71	12
Wood products	10	38	5	62	38	33	5	65	6
Pulp, paper and paperboard mills	14	14	5	76	49	24	5	63	9
Petroleum and coal products	67	25	0	83	50	50	42	64	4
Chemicals	11	20	20	69	43	3	6	61	2
Non-metallic mineral products	17	25	8	58	25	33	8	72	15
Primary metals	17	17	11	58	64	8	8	53	4
Fabricated metal products	15	31	23	77	62	8	8	88	4
Transportation equipment	23	18	9	86	59	0	9	75	1
Pipeline transportation	7	79	3	66	10	3	0	66	5
Total	**21**	**30**	**10**	**71**	**44**	**22**	**11**	**68**	**100**
2004 [3]									
Logging	28	49	13	64	41	13	10	57	3
Oil and gas extraction	32	48	22	67	40	29	21	88	6
Mining	40	38	14	58	33	15	22	83	8
Electric power generation, transmission and distribution	31	44	3	56	38	31	10	59	3
Natural gas distribution	33	50	17	75	42	58	17	80	1
Food	43	24	26	58	52	13	11	74	9
Beverage and tobacco products	31	25	19	63	38	0	25	80	1
Wood products	33	23	9	69	43	20	11	81	9
Pulp, paper and paperboard mills	13	13	10	83	69	15	9	90	10
Petroleum and coal products	65	30	22	83	39	39	22	79	2
Chemicals	38	30	13	65	47	12	13	71	14
Non-metallic mineral products	33	42	7	60	30	15	3	74	5
Primary metals	31	28	17	70	54	7	14	78	11
Fabricated metal products	31	29	33	64	47	12	5	62	5
Transportation equipment	40	17	15	82	51	8	12	83	6
Pipeline transportation	35	52	8	60	15	38	8	87	5
Total	**25**	**23**	**11**	**50**	**34**	**12**	**9**	**74**	**100**

1. Number of establishments in the industry that indicated encountering at least one obstacle as a percentage of all establishments that indicated encountering at least one obstacle.
2. Number of establishments that indicated encountering the obstacle as a percentage of all establishments that provided a response.
3. Adoption of new or significantly improved systems or equipment within a three year period, 2000 to 2002.

Note(s): This table includes reported data only.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 7
Drivers to the adoption of technologies to reduce greenhouse gas emissions by industry, 2002 and 2004

	Type of drivers						One or more drivers	
	Sufficient return on investment	Regulations	Voluntary agreement	Public relations	Corporate policy and culture and awareness	Other	Share of companies in industry	Industry share of reported drivers [1]
	percent [2]							
2002 [3]								
Logging	57	86	43	43	43	0	71	4
Oil and gas extraction	88	80	76	78	86	2	83	7
Mining	55	35	35	40	50	15	92	5
Electric power generation, transmission and distribution	67	67	62	81	86	5	86	11
Natural gas distribution	57	29	71	57	100	29	85	4
Food	53	53	47	41	76	6	89	8
Beverage and tobacco products	80	70	20	0	70	10	80	11
Wood products	65	40	45	40	70	0	79	6
Pulp, paper and paperboard mills	87	38	26	33	54	13	85	10
Petroleum and coal products	83	67	83	50	67	0	86	5
Chemicals	66	49	29	29	57	6	88	2
Non-metallic mineral products	62	23	15	31	38	8	85	14
Primary metals	67	39	50	31	64	8	88	5
Fabricated metal products	79	36	7	14	43	0	95	3
Transportation equipment	86	41	27	27	59	18	83	1
Pipeline transportation	87	53	80	83	87	7	87	5
Total	**74**	**51**	**47**	**46**	**67**	**7**	**85**	**100**
2004 [3]								
Logging	73	48	24	24	52	0	52	3
Oil and gas extraction	82	74	43	65	78	5	92	6
Mining	69	54	35	42	65	7	71	7
Electric power generation, transmission and distribution	59	56	46	64	64	8	65	4
Natural gas distribution	78	78	56	44	89	0	89	1
Food	80	57	19	24	52	10	72	9
Beverage and tobacco products	71	50	21	7	64	7	70	1
Wood products	69	52	18	35	63	7	55	9
Pulp, paper and paperboard mills	80	59	21	31	56	4	85	10
Petroleum and coal products	84	72	56	48	64	0	93	2
Chemicals	77	58	27	23	60	3	73	15
Non-metallic mineral products	67	55	20	33	62	5	69	5
Primary metals	78	48	26	31	49	11	75	11
Fabricated metal products	75	49	22	29	56	7	82	5
Transportation equipment	70	55	25	40	68	11	76	5
Pipeline transportation	76	71	55	71	98	0	83	5
Total	**54**	**41**	**21**	**26**	**44**	**4**	**72**	**100**

1. Number of establishments in the industry that indicated encountering at least one driver as a percentage of all establishments that indicated encountering at least one driver.
2. Number of establishments that indicated encountering the driver as a percentage of all establishments that provided a response.
3. Adoption of new or significantly improved systems or equipment within a three year period, 2000 to 2002.

Note(s): This table includes reported data only.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 8
Obstacles to the adoption of technologies to reduce greenhouse gas emissions by industry — Innovators versus non-innovators, 2002

	Lack of information or knowledge		Lack of available technology		Lack of skilled personnel		High cost of equipment	
	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator
	percent [1]							
Logging	43	38	57	43	14	10	71	43
Oil and gas extraction	35	20	35	40	10	5	88	50
Mining	10	29	20	38	5	11	50	52
Electric power generation, transmission and distribution	25	32	35	55	5	5	65	68
Natural gas distribution	33	0	50	33	0	0	83	33
Food	27	41	33	28	7	13	73	71
Beverage and tobacco products	40	56	10	19	30	19	80	59
Wood products	10	36	38	24	5	14	62	62
Pulp, paper and paperboard mills	14	24	14	22	5	10	76	68
Petroleum and coal products	67	50	25	38	0	13	83	38
Chemicals	11	32	20	35	20	9	69	61
Non-metallic mineral products	17	37	25	46	8	9	58	51
Primary metals	17	45	17	28	11	20	58	67
Fabricated metal products	15	41	31	21	23	18	77	82
Transportation equipment	23	50	18	26	9	14	86	55
Pipeline transportation	7	0	79	73	3	0	66	73
Total	**21**	**36**	**30**	**31**	**10**	**12**	**71**	**62**

	Lack of financing		Regulatory and policy barriers		Other	
	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator
	percent [1]					
Logging	29	33	0	5	14	5
Oil and gas extraction	52	5	48	20	21	30
Mining	30	35	20	9	20	20
Electric power generation, transmission and distribution	25	27	50	9	10	14
Natural gas distribution	50	0	67	33	17	33
Food	60	46	7	5	27	4
Beverage and tobacco products	30	56	0	3	0	16
Wood products	38	43	33	11	5	11
Pulp, paper and paperboard mills	49	59	24	19	5	8
Petroleum and coal products	50	25	50	25	42	0
Chemicals	43	40	3	17	6	11
Non-metallic mineral products	25	34	33	26	8	11
Primary metals	64	49	8	10	8	5
Fabricated metal products	62	46	8	10	8	8
Transportation equipment	59	40	0	7	9	14
Pipeline transportation	10	45	3	9	0	27
Total	**44**	**42**	**22**	**12**	**11**	**11**

1. Number of establishments that indicated encountering the obstacle as a percentage of all establishments that provided a response.

Note(s): Establishments who answered "Yes" to adopting new or significantly improved systems or equipment to reduce greenhouse gases during the period 2000-2002 are considered "innovators." Establishments who answered "no" to adopting new or significantly improved systems or equipment to reduce greenhouse gases during the period 2000-2002 are considered "non-innovators". This table includes reported data only. Due to changes in the methodology used to calculate the 2004 results, comparisons to 2002 results are not possible.

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 9
Obstacles to the adoption of technologies to reduce greenhouse gas emissions by industry — Innovators versus non-innovators, 2004

	Lack of information or knowledge		Lack of available technology		Lack of skilled personnel		High cost of equipment	
	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator
	percent [1]							
Logging	27	13	27	27	9	7	64	30
Oil and gas extraction	33	15	43	30	30	0	78	15
Mining	27	33	35	29	4	12	69	40
Electric power generation, transmission and distribution	39	10	33	20	6	0	50	27
Natural gas distribution	50	0	63	14	0	29	75	43
Food	38	27	26	12	29	15	62	34
Beverage and tobacco products	29	21	14	21	29	7	86	29
Wood products	33	15	9	14	15	3	61	35
Pulp, paper and paperboard mills	8	13	13	10	19	3	83	66
Petroleum and coal products	67	44	0	38	17	19	100	38
Chemicals	23	27	12	22	5	10	51	43
Non-metallic mineral products	40	20	20	32	7	4	53	41
Primary metals	20	24	26	17	15	11	57	48
Fabricated metal products	25	16	13	18	25	16	44	35
Transportation equipment	36	30	24	9	8	14	72	63
Pipeline transportation	63	7	58	39	4	2	79	36
Total	**31**	**21**	**25**	**20**	**15**	**9**	**67**	**41**

	Lack of financing		Regulation and policy barriers		Other		None	
	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator
	percent [1]							
Logging	27	22	9	7	9	5	18	40
Oil and gas extraction	43	11	30	11	22	11	0	37
Mining	15	30	15	11	15	18	8	20
Electric power generation, transmission and distribution	39	16	28	14	0	8	28	43
Natural gas distribution	50	14	75	14	25	0	0	43
Food	35	37	9	9	6	8	18	29
Beverage and tobacco products	57	14	0	0	0	29	14	21
Wood products	42	21	27	7	12	5	15	44
Pulp, paper and paperboard mills	77	50	4	19	4	10	2	15
Petroleum and coal products	50	19	67	6	42	0	0	38
Chemicals	37	31	9	8	7	10	26	30
Non-metallic mineral products	27	20	27	7	7	1	13	28
Primary metals	48	35	7	5	11	10	15	27
Fabricated metal products	31	26	0	7	0	4	13	38
Transportation equipment	36	43	4	7	8	11	0	23
Pipeline transportation	17	11	46	25	0	11	8	16
Total	**42**	**29**	**18**	**9**	**10**	**9**	**11**	**30**

1. Number of establishments that indicated encountering the obstacle as a percentage of all establishments that provided a response.

Note(s): Establishments who answered "Yes" to adopting new or significantly improved systems or equipment to reduce greenhouse gases during the period 2002 to 2004 are considered "innovators." Establishments who answered "no" to adopting new or significantly improved systems or equipment to reduce greenhouse gases during the period 2002 to 2004 are considered "non-innovators". This table includes reported data only. Due to changes in the methodology used to calculate the 2004 results, comparisons to 2002 results are not possible.

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 10

Drivers to the adoption of technologies to reduce greenhouse gas emissions by industry — Innovators versus non-innovators, 2002

	Sufficient return on investment		Regulations		Voluntary agreement		Public relations		Corporate policy and culture and awareness		Other	
	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator
	percent [1]											
Logging	57	33	86	20	43	5	43	23	43	30	0	0
Oil and gas extraction	88	55	80	55	76	30	78	30	86	45	2	5
Mining	55	44	35	27	35	14	40	20	50	40	15	3
Electric power generation, transmission and distribution	67	27	67	39	62	20	81	32	86	32	5	2
Natural gas distribution	57	67	29	33	71	67	57	33	100	33	29	0
Food	53	38	53	37	47	8	41	16	76	34	6	0
Beverage and tobacco products	80	40	70	24	20	12	0	14	70	36	10	7
Wood products	65	47	40	34	45	11	40	20	70	29	0	2
Pulp, paper and paperboard mills	67	67	38	61	26	24	33	24	54	53	13	6
Petroleum and coal products	83	53	67	41	83	41	50	24	67	35	0	0
Chemicals	66	43	49	44	29	22	29	22	57	39	6	5
Non-metallic mineral products	62	45	23	37	15	20	31	20	38	31	8	4
Primary metals	67	55	39	39	50	25	31	21	64	38	8	1
Fabricated metal products	79	45	36	36	7	13	14	22	43	24	0	5
Transportation equipment	86	42	41	31	27	7	27	11	59	25	18	4
Pipeline transportation	87	90	53	10	80	50	83	0	87	70	7	0
Total	**74**	**46**	**51**	**37**	**47**	**17**	**46**	**20**	**67**	**35**	**7**	**3**

1. Number of establishments that indicated the driver as a percentage of all establishments that provided a response.

Note(s): Establishments who answered "Yes" to adopting new or significantly improved systems or equipment to reduce greenhouse gases during the period 2000 to 2002 are considered "innovators." Establishments who answered "no" to adopting new or significantly improved systems or equipment to reduce greenhouse gases during the period 2000 to 2002 are considered "non-innovators." This table includes reported data only. Due to changes in the methodology used to calculate the 2004 results, comparisons to 2002 results are not possible.

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 11

Drivers to the adoption of technologies to reduce greenhouse gas emissions by industry — Innovators versus non-innovators, 2004

	Sufficient return on investment		Regulations		Voluntary agreement		Public relations	
	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator
	percent [1]							
Logging	55	30	45	18	27	8	18	10
Oil and gas extraction	85	52	78	44	52	15	65	44
Mining	65	40	35	36	31	20	46	22
Electric power generation, transmission and distribution	67	22	56	24	56	16	78	22
Natural gas distribution	75	14	88	0	63	0	50	0
Food	79	42	53	31	35	5	26	12
Beverage and tobacco products	71	36	57	21	29	7	14	0
Wood products	67	28	48	22	18	7	33	14
Pulp, paper and paperboard mills	77	55	52	44	21	14	42	14
Petroleum and coal products	83	69	75	56	50	50	58	31
Chemicals	51	51	47	36	30	15	26	13
Non-metallic mineral products	67	39	47	33	27	10	27	20
Primary metals	74	45	48	27	41	9	30	17
Fabricated metal products	63	36	31	26	19	11	13	16
Transportation equipment	64	38	48	30	28	11	36	21
Pipeline transportation	83	50	88	41	63	34	88	41
Total	**71**	**41**	**55**	**31**	**36**	**13**	**42**	**17**

	Corporate policy and culture and awareness		Other		None	
	Innovator	Non-innovator	Innovator	Non-innovator	Innovator	Non-innovator
	percent [1]					
Logging	18	25	0	0	27	47
Oil and gas extraction	80	52	4	4	0	22
Mining	65	36	8	4	8	34
Electric power generation, transmission and distribution	56	31	11	2	11	41
Natural gas distribution	100	0	0	0	0	57
Food	53	26	12	5	12	30
Beverage and tobacco products	71	29	14	0	0	43
Wood products	64	24	0	4	12	49
Pulp, paper and paperboard mills	56	38	2	4	4	20
Petroleum and coal products	75	44	0	0	0	13
Chemicals	58	35	5	2	14	28
Non-metallic mineral products	87	30	7	3	0	36
Primary metals	59	23	11	6	7	27
Fabricated metal products	38	29	13	2	0	40
Transportation equipment	72	32	16	4	0	30
Pipeline transportation	96	70	0	0	0	25
Total	**65**	**32**	**6**	**3**	**6**	**33**

1. Number of establishments that indicated the driver as a percentage of all establishments that provided a response.

Note(s): Establishments who answered "Yes" to adopting new or significantly improved systems or equipment to reduce greenhouse gases during the period 2002 to 2004 are considered "innovators." Establishments who answered "no" to adopting new or significantly improved systems or equipment to reduce greenhouse gases during the period 2002 to 2004 are considered "non-innovators." This table includes reported data only. Due to changes in the methodology used to calculate the 2004 results, comparisons to 2002 results are not possible.

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 12
Energy conservation processes and technologies by industry, 2002

	Cogeneration	Alternative fuel systems or equipment	Fuel substitution	Other
	percent [1]			
Logging	2	6	6	10
Oil and gas extraction	19	13	11	34
Mining	3	4	8	24
Electric power generation, transmission and distribution	22	13	14	31
Natural gas distribution	10	40	42	33
Food	2	2	5	18
Beverage and tobacco products	2	0	2	17
Wood products	8	3	11	16
Pulp, paper and paperboard mills	32	10	18	29
Petroleum and coal products	13	3	22	32
Chemicals	12	4	6	15
Non-metallic mineral products	0	3	8	13
Primary metals	2	4	4	25
Fabricated metal products	3	0	0	7
Transportation equipment	2	1	5	34
Pipeline transportation	10	8	8	48
Total	**9**	**5**	**8**	**22**

	Renewable energy technologies					Total [3]
	Small, mini, or micro-hydroelectric facility	Solar energy	Wind energy	Biomass energy [2]	Other renewable energy	
	percent [1]					
Logging	6	3	0	19	2	**36**
Oil and gas extraction	11	49	8	12	6	**75**
Mining	7	17	0	9	6	**48**
Electric power generation, transmission and distribution	24	11	14	15	13	**58**
Natural gas distribution	0	27	0	10	0	**69**
Food	0	0	0	5	1	**20**
Beverage and tobacco products	0	0	0	3	0	**21**
Wood products	0	1	0	41	8	**52**
Pulp, paper and paperboard mills	9	0	0	58	16	**81**
Petroleum and coal products	0	3	0	9	3	**53**
Chemicals	0	0	0	5	2	**26**
Non-metallic mineral products	0	0	0	7	1	**8**
Primary metals	2	0	0	4	1	**32**
Fabricated metal products	0	0	1	1	0	**10**
Transportation equipment	0	3	0	1	1	**33**
Pipeline transportation	0	29	0	5	3	**74**
Total	**3**	**6**	**1**	**14**	**4**	**40**

1. Number of establishments that indicated they used at least one energy conservation process or technology as a percentage of the total number of establishments that provided a response.
2. Examples include energy crops and waste-to-energy.
3. Number of establishments indicating they used the process or technology as a percentage of all establishments that provided a response.

Note(s): This table includes reported data only.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 13
Energy conservation processes and technologies by industry, 2004

	Cogeneration	Alternative fuel systems or equipment	Fuel substitution	Waste energy recovery and reuse	Use of energy management or monitoring systems	Performed energy audit past three years (2002 to 2004)	Other systems, equipment or employee training
	percent [1]						
Logging	5	8	3	18	11	9	9
Oil and gas extraction	20	22	16	38	50	39	38
Mining	3	5	2	24	39	33	24
Electric power generation, transmission and distribution	14	14	9	25	43	26	32
Natural gas distribution	0	13	20	7	27	33	20
Food	1	4	3	35	31	29	24
Beverage and tobacco products	10	14	14	38	29	29	29
Wood products	10	9	12	28	24	19	15
Pulp, paper and paperboard mills	33	17	27	74	58	58	30
Petroleum and coal products	7	0	14	72	52	52	48
Chemicals	9	2	6	22	29	25	19
Non-metallic mineral products	0	11	11	18	13	11	18
Primary metals	2	5	5	19	29	26	23
Fabricated metal products	1	0	3	12	21	20	19
Transportation equipment	0	1	1	25	38	36	36
Pipeline transportation	10	26	7	13	51	40	38
Total	**8**	**8**	**8**	**29**	**33**	**29**	**25**

	Renewable energy technologies						Total [3]
	Small, mini- or micro-hydroelectric facility	Solar energy	Wind energy	Biomass energy [2]	Geothermal	Other renewable energy	
	percent [1]						
Logging	3	11	0	14	0	1	**41**
Oil and gas extraction	3	49	3	0	0	1	**82**
Mining	2	13	0	0	0	2	**60**
Electric power generation, transmission and distribution	20	7	12	6	4	10	**64**
Natural gas distribution	0	40	0	0	0	7	**60**
Food	0	1	0	3	0	2	**57**
Beverage and tobacco products	0	0	0	0	0	0	**48**
Wood products	0	1	0	30	1	3	**57**
Pulp, paper and paperboard mills	11	1	1	54	0	2	**88**
Petroleum and coal products	0	7	0	3	0	0	**86**
Chemicals	0	0	0	0	0	0	**53**
Non-metallic mineral products	0	0	0	5	0	0	**41**
Primary metals	2	0	0	1	1	1	**50**
Fabricated metal products	0	0	0	1	0	0	**40**
Transportation equipment	0	4	0	0	0	1	**64**
Pipeline transportation	3	35	1	3	0	1	**71**
Total	**3**	**7**	**1**	**9**	**0** [s]	**2**	**59**

1. Number of establishments indicating they used the process or technology as a percentage of all establishments that provided a response.
2. Examples include energy crops and waste-to-energy.
3. Number of establishments that indicated they used at least one energy conservation process or technology as a percentage of the total number of establishments that provided a response.

Note(s): This table includes reported data only.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 14
Energy conservation processes and technologies by province or territory, 2002

	Cogeneration	Alternative fuel systems or equipment	Fuel substitution	Other
	percent [1]			
Newfoundland and Labrador	5	0	5	24
Prince Edward Island	10	0	20	40
Nova Scotia	13	7	10	19
New Brunswick	11	2	12	23
Quebec	5	3	9	17
Ontario	7	3	5	22
Manitoba	5	11	13	24
Saskatchewan	8	7	14	27
Alberta	16	8	8	27
British Columbia	13	8	12	20
Yukon Territory, Northwest Territories and Nunavut	10	11	11	33
Total	**9**	**5**	**8**	**22**

	Renewable energy technologies					Total [3]
	Small, mini, or micro-hydroelectric facility	Solar energy	Wind energy	Biomass energy [2]	Other renewable energy	
	percent [1]					
Newfoundland and Labrador	9	0	0	14	5	**36**
Prince Edward Island	0	0	0	20	0	**50**
Nova Scotia	7	0	3	23	4	**43**
New Brunswick	5	2	0	31	10	**50**
Quebec	1	2	0	14	5	**34**
Ontario	3	2	1	7	2	**33**
Manitoba	0	5	0	15	7	**39**
Saskatchewan	2	20	3	10	3	**51**
Alberta	4	19	3	16	5	**55**
British Columbia	5	8	1	31	5	**50**
Yukon Territory, Northwest Territories and Nunavut	30	20	0	0	30	**70**
Total	**3**	**6**	**1**	**14**	**4**	**40**

1. Number of establishments that indicated they used at least one energy conservation process or technology as a percentage of the total number of establishments that provided a response.
2. Examples include energy crops and waste-to-energy.
3. Number of establishments indicating they used the process or technology as a percentage of all establishments that provided a response.

Note(s): This table includes reported data only. This table excludes the "other manufacturing" industry category.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 15
Energy conservation processes and technologies by province or territory, 2004

	Cogeneration	Alternative fuel systems or equipment	Fuel substitution	Waste energy recovery and reuse	Use of energy management or monitoring systems	Performed energy audit past three years (2002 to 2004)	Other systems, equipment or employee training
	percent [1]						
Newfoundland and Labrador	4	12	12	16	36	12	28
Prince Edward Island	0	25	13	50	13	13	38
Nova Scotia	11	11	17	37	40	37	3
New Brunswick	13	15	28	37	41	37	26
Quebec	5	5	8	33	30	30	19
Ontario	6	4	4	22	29	26	25
Manitoba	2	11	8	21	43	34	40
Saskatchewan	6	15	10	27	36	34	22
Alberta	15	14	10	31	39	29	31
British Columbia	14	16	15	36	34	32	18
Yukon Territory, Northwest Territories and Nunavut	22	22	0	44	67	22	44
Total	**8**	**8**	**8**	**29**	**33**	**29**	**25**

	Renewable energy technologies						Total [3]
	Small, mini- or micro-hydroelectric facility	Solar energy	Wind energy	Biomass energy [2]	Geothermal	Other renewable energy	
	percent [1]						
Newfoundland and Labrador	12	0	0	8	0	0	**48**
Prince Edward Island	0	0	0	25	0	0	**63**
Nova Scotia	6	11	6	14	0	3	**57**
New Brunswick	7	2	0	28	0	4	**78**
Quebec	1	2	0	14	0	2	**55**
Ontario	2	2	1	4	1	1	**54**
Manitoba	0	6	2	6	2	8	**64**
Saskatchewan	0	19	1	7	0	0	**66**
Alberta	1	19	1	5	0	1	**66**
British Columbia	6	11	0	21	1	3	**66**
Yukon Territory, Northwest Territories and Nunavut	11	33	0	0	0	0	**60**
Total	**3**	**7**	**1**	**9**	**0** [s]	**2**	**59**

1. Number of establishments indicating they used the process or technology as a percentage of all establishments that provided a response.
2. Examples include energy crops and waste-to-energy.
3. Number of establishments that indicated they used at least one energy conservation process or technology as a percentage of the total number of establishments that provided a response.

Note(s): This table includes reported data only. This table excludes the "other manufacturing" industry category.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 16
Distribution of energy conservation processes and technologies by establishment size

	Number of employees per establishment			
	Fewer than 100	100 to 499	500 to 999	More than 999
	percent [1]			
2002				
Cogeneration	5	9	10	16
Fuel substitution	4	9	10	20
Alternative fuel systems or equipment	3	5	6	10
Other	14	20	27	53
Renwable energy technologies				
Small, mini, or micro-hydroelectric facility	2	3	6	10
Solar energy systems or equipment	5	4	6	10
Wind energy systems or equipment	1	1	1	9
Biomass energy [2]	8	16	19	13
Other renewable energy systems or equipment	2	5	6	9
Total [3]	**27**	**41**	**49**	**64**
Percentage of total employees [4]	**28**	**43**	**51**	**74**
2004				
Cogeneration	5	9	11	11
Alternative fuel systems or equipment	5	8	9	16
Fuel substitution	4	10	9	17
Waste energy recovery and reuse	18	31	41	52
Use of energy management or monitoring systems	20	32	48	65
Performed energy audit past three years (2002 to 2004)	17	29	45	54
Other systems, equipment or employee training	14	23	34	49
Renewable energy technologies				
Small, mini- or micro-hydroelectric facility	0	3	5	10
Solar energy systems or equipment	5	4	7	16
Wind energy systems or equipment	0	0	1	10
Biomass energy [2]	4	13	12	10
Geothermal	0	0	0	1
Other renewable energy systems or equipment	1	1	3	10
Total [3]	**42**	**60**	**77**	**88**
Percentage of total employees [4]	**44**	**61**	**77**	**90**

1. Number of establishments indicating they used the energy conservation process or technology as a percentage of the total number of establishments that provided a response.
2. Examples include energy crops and waste-to-energy.
3. Number of establishments that indicated they used at least one energy conservation process or technology as a percentage of the total number establishments that provided a response.
4. Employment of establishments indicating they used at least one energy conservation process or technology as a percentage of the total employment of the establishments that provided a response.

Note(s): This table includes reported data only. This table excludes the "other manufacturing"and "pipeline transportation" industry categories.
Source(s): Statistics Canada, Environment Accounts and Statistics Division.